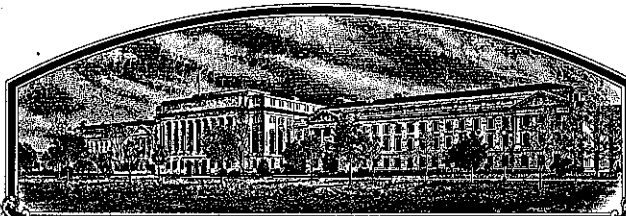


No.

9500193



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

*Northrup King Company*

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE FOREGOING PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (34 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'S29-18'



Attest:

*Marsha A. Hines*  
Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this thirtieth day of August in the year of our Lord one thousand nine hundred and ninety-six.

*Samuel H. Hildner*  
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
SCIENCE DIVISION

## APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(INSTRUCTIONS ON REVERSE)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) Northrup King Co.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. W905988, X9429		3. VARIETY NAME S29-18	
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) P. O. Box 949 Washington, Iowa 52353-0949 Attention: Dr. John C. Thorne		5. PHONE (include area code)		FOR OFFICIAL USE ONLY	
6. GENUS AND SPECIES NAME Glycine max		7. FAMILY NAME (Botanical) Leguminosae		PVPO NUMBER 9500193	
8. CROP KIND NAME (Common Name) Soybean		9. DATE OF DETERMINATION September, 1989		Filing and Examination Fee: \$ 2450.00	
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation		11. IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware		Date May 19, 1995 Time <input type="checkbox"/> A.M. <input type="checkbox"/> P.M.	
12. DATE OF INCORPORATION 1976		13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Dr. John C. Thorne Northrup King Co. P. O. Box 949 Washington, Iowa 52353-0949		Filing Fee: \$ 300.00 Date July 22, 1996	

PHONE (include area code): 319-653-6645

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)

a. ☒ Exhibit A, Origin and Breeding History of the Variety  
b. ☒ Exhibit B, Novelty Statement  
c. ☒ Exhibit C, Objective Description of Variety  
d. ☐ Exhibit D, Additional Description of Variety  
e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership  
f. ☒ Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office \_\_\_\_\_  
g. ☒ Filing and Examination Fee (\$2,325) made payable to "Treasurer of the United States"

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act) ☐ YES (If "YES," answer items 16 and 17 below) ☒ NO (If "NO," skip to item 18 below)

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? ☐ YES ☒ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? ☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

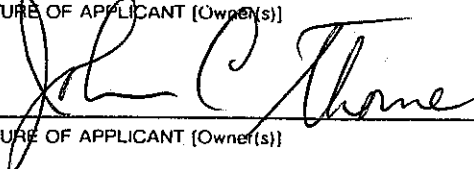
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? ☐ YES (If "YES," through ☐ Plant Variety Protection Act ☐ Patent Act. Give date: \_\_\_\_\_). ☒ NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES? ☒ YES (If "YES," GIVE NAMES OF COUNTRIES AND DATES) U.S. March, 1995 ☐ NO

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT [Owner(s)] 	CAPACITY OR TITLE Soybean Research Director	DATE 5-5-95
SIGNATURE OF APPLICANT [Owner(s)]	CAPACITY OR TITLE	DATE

## EXHIBIT A

### Origin and Breeding History of the Variety

The soybean variety 'S29-18' is derived from a single F6 plant from the cross 'S31-33' (2) x 'Century 84'. The cross was made in the summer of 1986 at the Northrup King Research Center at Washington, Iowa. The F1 and F2 generations were grown at the Northrup King Research Center at Waimea, Kauai, Hawaii, in the winter of 1986-87; the F3 at Washington in the summer of 1987; the F4 and F5 at Waimea in the winter of 1987-88, and the F6 at Washington in the summer of 1988. The F1 was bulk harvested. The F2 through F5 were advanced by harvesting 2-4 seeds per plant and planting 600 seed from the resulting bulk. In the fall of 1988, approximately 50 plants were harvested and threshed individually. The seed from each of these plants were planted in a progeny row at Washington in 1989. One of these, numbered W905988, was selected based on uniformity and agronomic characteristics for further testing. This line was subsequently tested under the temporary designation X9429 and named S29-18. It has been tested at several central cornbelt locations in the U.S. from 1990 through 1994 and found to yield well compared to other late Group 2 varieties. Descriptive characteristics including tawny pubescence, tan pods, and black hilum (may contain up to 2% other hilum) have been identified and confirmed. The original selection was found to be heterogeneous for flower color. S29-18 is a reselected white flowered derivative, as described below. S29-18 has been tested in the field for iron deficiency chlorosis and found to be moderately resistant. Field tests have also shown it to have moderate resistance to brown stem rot. It has been tested for reaction to Races 1, 3, 4, 7, and 17 of *Phytophthora sojae* using hypocotyl inoculation of greenhouse grown plants and found to be susceptible.

In the winter of 1991-92, 500 seeds of W905988 were planted at Waimea, and 100 plants with white flowers were harvested and threshed individually. The progeny of these 100 plants were grown at Washington in the summer of 1992 to monitor variability and to produce Pedigree Seed. A few plants which had purple flowers or gray pubescence were removed. These were assumed to have resulted from mechanical mixture or outcrossing. Four rows which appeared to be segregating for flower color were removed. The other rows were uniform and were bulked to produce Pedigree Seed. This seed was planted in the Washington area in 1993 to produce Breeder Seed. The increase block was rogued carefully during flowering and at maturity and found to be uniform.

Foundation Seed of S29-18 was produced in 1994 from the 1993 Breeder Seed. The Iowa Crop Improvement Association inspected the fields and found them to meet the standards for Foundation Seed. The National Soybean Variety Review Board approved S29-18 for Certification in December, 1994.

S29-18 is stable and uniform. Over four years of testing and three cycles of seed increase, we have observed no variants. Any off-type plants removed from increase fields were assumed to have arisen from admixture or outcrossing. Varietal purity will be maintained using progeny rows as described previously as needed for the life of the variety.

**EXHIBIT B****Novelty Statement for the Variety**

S29-18 is most similar to S29-11 and A2872. It can be differentiated from S29-11 on the basis of resistance to Soybean Cyst Nematode, Race 3. S29-18 is susceptible while S29-11 is resistant. It can be differentiated from A2872 on the basis of flower color. S29-18 has white flowers while A2872 has purple flowers.

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
LIVESTOCK, MEAT, GRAIN & SEED DIVISION  
PLANT VARIETY PROTECTION OFFICE  
BELTSVILLE, MARYLAND 20705

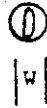
EXHIBIT C  
(Soybean)

OBJECTIVE DESCRIPTION OF VARIETY  
SOYBEAN (*Glycine max* L.)

NAME OF APPLICANT(S) Northrup King Co.	TEMPORARY DESIGNATION W905988, X9429	VARIETY NAME S29418
ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code) 510 N. 12th Ave. P. O. Box 949 Washington, Iowa 52353-0949		FOR OFFICIAL USE ONLY PVPO NUMBER 9500193

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g.,  ).

## 1. SEED SHAPE:



1 = Spherical (L/W, L/T, and T/W ratios = < 1.2)  
3 = Elongate (L/T ratio > 1.2; T/W = < 1.2)

2 = Spherical Flattened (L/W ratio > 1.2; L/T ratio = < 1.2)  
4 = Elongate Flattened (L/T ratio > 1.2; T/W > 1.2)

## 2. SEED COAT COLOR: (Mature Seed)

1 = Yellow      2 = Green      3 = Brown      4 = Black      5 = Other (Specify) \_\_\_\_\_

## 3. SEED COAT LUSTER: (Mature Hand Shelled Seed)

1 = Dull ('Corsoy 79'; 'Braxton')      2 = Shiny ('Nebsoy'; 'Gasoy 17')      Intermediate

## 4. SEED SIZE: (Mature Seed)

Grams per 100 seeds

## 5. HILUM COLOR: (Mature Seed)

1 = Buff      2 = Yellow      3 = Brown      4 = Gray      5 = Imperfect Black      6 = Black      7 = Other (Specify) \_\_\_\_\_

## 6. COTYLEDON COLOR: (Mature Seed)

1 = Yellow      2 = Green

## 7. SEED PROTEIN PEROXIDASE ACTIVITY:

1 = Low      2 = High

## 8. SEED PROTEIN ELECTROPHORETIC BAND:

1 = Type A (SP1<sup>a</sup>)      2 = Type B (SP1<sup>b</sup>)

## 9. HYPOCOTYL COLOR:

1 = Green only ('Evans'; 'Davis')      2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')  
3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')  
4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

## 10. LEAFLET SHAPE:

1 = Lanceolate      2 = Oval      3 = Ovate      4 = Other (Specify) \_\_\_\_\_

4

## 11. LEAFLET SIZE:

☐ 21 = Small ('Amsoy 71'; 'A5312')  
3 = Large ('Crawford'; 'Tracy')

2 = Medium ('Corsoy 79'; 'Gasoy 17')

## 12. LEAF COLOR:

☐ 21 = Light Green ('Weber'; 'York')  
3 = Dark Green ('Gnome'; 'Tracy')

2 = Medium Green ('Corsoy 79'; 'Braxton')

## 13. FLOWER COLOR:

☐ 1

1 = White

2 = Purple

3 = White with purple throat

## 14. POD COLOR:

☐ 1

1 = Tan

2 = Brown

3 = Black

## 15. PLANT PUBESCENCE COLOR:

☐ 2

1 = Gray

2 = Brown (Tawny)

## 16. PLANT TYPES:

☐ 21 = Slender ('Essex'; 'Amsoy 71')  
3 = Bushy ('Gnome'; 'Govan')

2 = Intermediate ('Amcor'; 'Braxton')

## 17. PLANT HABIT:

☐ 3

1 = Determinate ('Gnome'; 'Braxton')

2 = Semi-Determinate ('Will')

3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

## 18. MATURITY GROUP:

☐ 5

1 = 000

2 = 00

3 = 0

4 = I

5 = II

6 = III

7 = IV

8 = V

9 = VI

10 = VII

11 = VIII

12 = IX

13 = X

## 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

## BACTERIAL DISEASES:

☐Bacterial Pustule (*Xanthomonas phaseoli* var. *sojensis*)☐Bacterial Blight (*Pseudomonas glycinea*)☐Wildfire (*Pseudomonas tabaci*)

## FUNGAL DISEASES:

☐Brown Spot (*Septoria glycines*)Frogeye Leaf Spot (*Cercospora sojina*)☐

Race 1

☐

Race 2

☐

Race 3

☐

Race 4

☐

Race 5

☐

Other (Specify)

☐Target Spot (*Corynespora cassiicola*)☐Downy Mildew (*Peronospora trifoliorum* var. *manshurica*)☐Powdery Mildew (*Microsphaera diffusa*)☐ 2Brown Stem Rot (*Cephalosporium gregatum*)

Moderately Resistant

☐Stem Canker (*Diaporthe phaseolorum* var. *caulivora*)

## 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

## FUNGAL DISEASES: (Continued)

☐ Pod and Stem Blight (*Diaporthe phaseolorum* var; *sojae*)  
☐ Purple Seed Stain (*Cercospora kikuchii*)  
☐ Rhizoctonia Root Rot (*Rhizoctonia solani*)  
☐ Phytophthora Rot (*Phytophthora megasperma* var. *sojae*)  
☒ Race 1    ☒ Race 2    ☒ Race 3    ☒ Race 4    ☒ Race 5    ☒ Race 6    ☒ Race 7  
☒ Race 8    ☒ Race 9    ☐ Other (Specify) \_\_\_\_\_

## VIRAL DISEASES:

☐ Bud Blight (Tobacco Ringspot Virus)  
☐ Yellow Mosaic (Bean Yellow Mosaic Virus)  
☐ Cowpea Mosaic (Cowpea Chlorotic Virus)  
☐ Pod Mottle (Bean Pod Mottle Virus)  
☐ Seed Mottle (Soybean Mosaic Virus)

## NEMATODE DISEASES:

☐ Soybean Cyst Nematode (*Heterodera glycines*)  
☐ Race 1    ☐ Race 2    ☒ Race 3    ☒ Race 4    ☐ Other (Specify) \_\_\_\_\_  
☐ Lance Nematode (*Hoplolaimus Colombus*)  
☐ Southern Root Knot Nematode (*Meloidogyne incognita*)  
☐ Northern Root Knot Nematode (*Meloidogyne Hapla*)  
☐ Peanut Root Knot Nematode (*Meloidogyne arenaria*)  
☐ Reniform Nematode (*Rotylenchulus reniformis*)  
☐ OTHER DISEASE NOT ON FORM (Specify): \_\_\_\_\_

## 20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

☒ 2 Iron Chlorosis on Calcareous Soil    Moderately Resistant  
☐ Other (Specify) \_\_\_\_\_

## 21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

☐ Mexican Bean Beetle (*Epilachna varivestis*)  
☐ Potato Leaf Hopper (*Empoasca fabae*)  
☐ Other (Specify) \_\_\_\_\_

## 22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Shape	A2872	Seed Coat Luster	S29-11
Leaf Shape	Pio. 9303	Seed Size	S29-11
Leaf Color	S31-33	Seed Shape	S29-11
Leaf Size	A2872	Seedling Pigmentation	S31-33

23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

VARIETY	NO. OF DAYS MATURITY	PLANT LODGING SCORE	CM PLANT HEIGHT	LEAFLET SIZE		SEED CONTENT		SEED SIZE G/100 SEEDS	NO. SEEDS/POD
				CM Width	CM Length	% Protein	% Oil		
Submitted	132	3.4	92	7.2	12.7	39.8	21.1	14.1	
Pio. 9303 Name of Similar Variety	132	3.5	86	6.9	12.1	40.4	21.8	17.8	

PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTI-A<sub>2</sub> in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.



**EXHIBIT E****Statement of the Basis of Applicant's Ownership**

Soybean variety S29-18 was developed from germplasm sources cited in Exhibit A of this application. Northrup King Co. believes that the variety is novel as defined in the Plant Variety Protection Act and, therefore, that Northrup King is the sole owner of the variety.

